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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/737,905	12/15/2000	James A. Dirksen	207617	2436

29050 7590 11/25/2003

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EXAMINER

CHEN, KIN CHAN

ART UNIT

PAPER NUMBER

1765

DATE MAILED: 11/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/737,905

Applicant(s)

DIRKSEN ET AL.

Examiner

Kin-Chan Chen

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

### DETAILED ACTION

1. The final rejection (June 25, 2003, P. Vanessa) is withdrawn. The non-final rejection follows.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cadien et al. (US 5,340,370; hereinafter "Cadien") or Feeney et al. (US 6,294,105; hereinafter "Feeney") in view of Ohmi et al. (US 5,895,509; hereinafter "Ohmi").

Cad战略 (abstract, col. 6-7) or Feeney (abstract, col. 4) teaches that a method of polishing or planarizing a substrate comprising abrading a least of the surface of a substrate comprising a metal, metal oxide, metal composite or mixture thereof. A composition may comprise a metal oxide abrasive and a liquid carrier wherein the composition has a pH of about 7 or less.

Unlike the claimed invention, Cadien or Feeney does not teach the metal oxide abrasive has a surface characteristic of a total surface hydroxyl group density no greater than about 3 hydroxyl groups per nm<sup>2</sup>. In a abrasive composition for CMP, Ohmi teaches (col. 3, lines 55-57) that by addition of isopropyl alcohol in the abrasive, the

abrasive grains becomes reluctant to adhere to the wafer and making cleaning after polishing easy. Hence, it would have been obvious to one with ordinary skill in the art to modify Cadien or Feeney by adding isopropyl alcohol in the abrasive as taught by Ohmi so that the abrasive grains becomes reluctant to adhere to the wafer and making cleaning after polishing easy. As such, the same materials are used with the same process steps (see the specification, page 3, line 34) and same purpose (see the specification, page 1, lines 33-35), it appears that the method of combined prior art would inherently possess the claimed characteristic (such as the metal oxide abrasive has a surface characteristic of a total surface hydroxyl group density no greater than about 3 hydroxyl groups per  $\text{nm}^2$ ).

Dependent claims differ from the combined prior art by specifying well-known features (such as various substrates and abrasives) to the art of semiconductor device fabrication. A person having ordinary skill in the art would have found it obvious to modify the combined prior art by adding any of same well-known features to same in order to provide their art recognized advantages and produce an expected result.

4. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cadien et al. (US 5,340,370; hereinafter "Cadien") or Feeney et al. (US 6,294,105; hereinafter "Feeney") in view of Kohyama et al. (US 4,664,679; hereinafter "Kohyama").

Cadien (abstract, col. 6-7) or Feeney (abstract, col. 4) teaches that a method of polishing or planarizing a substrate comprising abrading at least of the surface of a substrate comprising a metal, metal oxide, metal composite or mixture thereof. A

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composition may comprise a metal oxide abrasive and a liquid carrier wherein the composition has a pH of about 7 or less.

Unlike the claimed invention, Cadien or Feeney does not teach the metal oxide abrasive has a surface characteristic of a total surface hydroxyl group density no greater than about 3 hydroxyl groups per  $\text{nm}^2$ . In a abrasive composition for polishing of semiconductor, Kohyama teaches (col. 1, lines 19-27 and 65-67; col. 2, lines 7-15, 42-44, 63-65) that abrasives may be reacted with various coupling agents or esterified with alcohol so as to provide a good dispersion and solve the surface roughness problem and become convenience for handling. Hence, it would have been obvious to one with ordinary skill in the art to modify Cadien or Feeney by reacting the abrasives with coupling agents or esterifying abrasives with alcohol as taught by Kohyama in order to provide a good dispersion and solve the surface roughness problem and become convenience for handling (so-called low adherence of abrasives to the substrate in the specification, page 3, line 9). As such, the same materials are used with the same process steps (see the specification, page 3, line 34 through page 4, line 3), it appears that the method of combined prior art would inherently possess the claimed characteristic (such as the metal oxide abrasive has a surface characteristic of a total surface hydroxyl group density no greater than about 3 hydroxyl groups per  $\text{nm}^2$ ).

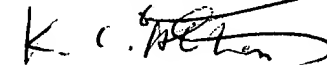
Dependent claims differ from the combined prior art by specifying well-known features (such as various substrates and abrasives) to the art of semiconductor device fabrication. A person having ordinary skill in the art would have found it obvious to

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modify the combined prior art by adding any of same well-known features to same in order to provide their art recognized advantages and produce an expected result.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (703) 305-0222. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (703) 305-2667. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-2934.

NOVEMBER 17, 2003



Kin-Chan Chen  
Primary Examiner  
Art Unit 1765